

Coil arrangement with variable inductance

Patent claims

1. A coil arrangement with variable inductance having two separate toroid coils (40, 42; 52, 54) which carry working windings (46, 48; 56, 58), and a control winding (50; 60) encompassing the two wound toroid coils for the purpose of pre-magnetizing the core material of the toroid coils (40, 42; 52, 54).
2. A coil arrangement according to claim 1, characterized in that the toroid coils (40, 42) are arranged next to each other in such a way that their axes of symmetry (44) are in line.
3. A coil arrangement according to claim 2, characterized in that the windings of the control winding (50) are distributed evenly over the circumference of the two toroid coils (40, 42).
4. A coil arrangement according to claim 1, characterized in that the two toroid coils (52, 54) are arranged adjacent to each other in a common plane.
5. A coil arrangement according to claim 1, characterized in that each of the toroid coils (40, 42; 52, 54) is wound with the working windings (46, 48; 56, 58) in a single layer.
6. A coil arrangement according to claim 1, characterized in that each working winding (46, 48; 56, 58) is formed from a single insulated wire, a group of parallel non-twisted insulated wires or from a litz wire consisting of twisted single insulated wires.

7. A coil arrangement according to claim 1, characterized in that each working winding (46, 48; 56, 58) is evenly distributed around the periphery of the respective toroid coil.
8. A coil arrangement according to claim 1, characterized in that the two toroids (40, 42; 52, 54) have identical dimensions and the two working windings (46, 48; 56, 58) have essentially the same number of turns and identical wire thicknesses.
9. A coil arrangement according to claim 1, characterized in that the working windings (46, 48; 56, 58) consist of a single wire or parallel non-twisted single wires, whereby the single wire thickness is not greater than three times the skin effect penetration depth of the working frequency.
10. A coil arrangement according to claim 1, characterized in that the working windings (46, 48; 56, 58) are formed from a twisted litz wire with the diameter of the individual wires being not greater than the single skin effect penetration depth.
11. A coil arrangement according to claim 1, characterized in that the working windings (46, 48; 56, 58) are connected in parallel and the winding direction of the working windings (46, 48; 56, 58) is chosen such that when a current flows in the working windings, the directions of its magnetic fields in the control coil (50) point are opposite to each other.
12. A coil arrangement according to claim 1, characterized in that the working windings (46, 48; 56, 58) are connected in series and the winding direction of the working windings (46, 48; 56, 58) is so chosen that when a current flows in the working windings, the directions of its magnetic fields in the control coil (50) point in the opposite direction to each other.